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SOME INFORMATION ON REINFORCED CONCRETE STRUCTURES IN PRESENT-DAY RUSSIA (1926)

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There is at present in many western European countries a lively interest in the rebirth of Russia. Despite all obstacles, conditions are improving. The fact of importance to German enterprise is that nowadays, a Russia without reinforced concrete is hardly conceivable; therefore, some information regarding this subject may be of interest. The following data are in no way to be taken as well-founded discussions; they are merely observations made by the author on his tour of inspection from Moscow to the Persian-Turkish border and from the Crimea to Baku.

Contemporary Russian industry is still bound to the main railroad lines. It is thus possible to see much from a railroad car that will amplify previous conceptions.

Reinforced concrete construction was established in Russia prior to the war. I was personally familiar with the famous factories of the Baltic States, particularly those in Riga, and on this trip I noticed many other things — innumerable new projects such as water towers, warehouses, locomotive sheds, factories, etc., which had been awaiting completion since 1914.

Even though reasons for their present state were evident in many cases, the presence of nearby makeshift structures — which in most cases were more of an expense than completion of the structure would have been — brings to light the fact that their non-completion must be based on something else. There is a lack of scientific and technical growth and there is simply no enthusiasm for its development. This condition is so far advanced that they have resorted to the I-beam for the simplest projects of skeleton construction. Girders and landing joists are of I-beams topped by simple reinforced concrete slabs.

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structures whose entire plan, architectural and economic, presupposes the use of reinforced concrete [illegible] because girder shipments were delayed ad infinitum -- in stone or even wood.

My questions in relation to this matter either were answered evasively, or the excuse was offered that there was a shortage of [illegible] reinforcement. In one case, I was even told that the Russian climate was not conducive to the use of reinforced concrete in that the great variations in temperature led to early deterioration, spalling in winter under the high daytime temperatures was dangerous and, in one actual case, had caused complete destruction. Since these last remarks came from an authoritative source, I decided to get to the bottom of the matter, and obtained permission to see and examine the building in question. It is a rather large foundry of a metallurgical plant, and it was built by a French concern. I will omit the name of the firm and location. For there is so much irony here, and the results are so significant that I should not want to withhold the outcome of my observations from the technical world.

The halls with crane tracks were erected in 1914, and at the beginning of the war were complete but for the roof-forming, which was to be of iron construction. Nothing has been done since.

The present picture is very sad. Most of the concrete has fallen from the front side, other sections have cracked through for approximately one-half meter; other construction members similarly exhibit severe deterioration; the reinforcement is almost universally bare, and the concrete can be pulverized with the fingers. After exhaustive repair, the only usable portion is a part of the lower story protected by an integrated reinforced concrete floor.

None of the reinforced concrete framework was plastered. I ascertained the following during the inspection:

1. All construction, with the exception of the crane-track supports appears to have been extraordinarily poorly measured.

2. The building covers approximately 5,000 square meters, but has not a single expansion joint.

3. No measures are provided for the protection of the unfinished structure from the weather.

4. Neither the concrete itself nor the concrete work is impressive. It appears that the iron was not cleaned at all.

5. The reinforcing job is very carelessly done. The iron is stuck in the middle of columns and beams without any connection; the logical thing to do was to use stirrups, but there were none present. I could not find openings in the supports; the iron was so closely bunched that concrete could not get in between the rods at all.

From the above, I draw the following conclusions:

1. The first cracks resulted from stresses in the absence of expansion joints.

2. These cracks widened rapidly over a 24-hour period because of the great variations in temperature (-20 to 40 degrees) in spring, and facilitated the contact of sulphur-containing air from the nearby smelting plant with the iron, causing its extensive deterioration.

3. The partial collapse came about through scant reinforcement [illegible] coupled with the [illegible]

4. Besides the general practices long known in Germany, if the above-mentioned points are satisfactorily remedied there is no reason for avoiding reinforced concrete in this area. This is emphasized by the fact that in the immediate vicinity I observed various excellent projects. Special attention must naturally attend stresses and the effects of frost, snow, and smelting-plant gases, and there must be an extremely careful plastering of the building members.

I must mention the fact that the use of blast furnace slag for building purposes has been given particular attention for over 30 years. I saw curbstones, stair slabs, even concrete streets which, though badly damaged, left a good impression.

A good sample of German reinforced-concrete work is the power plant near Tiflis. As a result of an automobile breakdown, I had an opportunity to view it from the far side of the river. It was a joy to behold.

There is great opportunity for Germany to take part in Russian reconstruction. May her capacities not fall below expectations!

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